DRAFT EAST AFRICAN STANDARD

Heavy fuel oils — Specification

EAST AFRICAN COMMUNITY
Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 068, Petroleum and petroleum products.

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.
Heavy fuel oils — Specification

1 Scope

This Draft East Africa Standard specifies requirements, sampling and test methods for heavy fuel oils intended for oil-fired furnaces and boilers for industrial use.

2 Normative references

The following referenced documents referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ASTM D93, Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
ASTM D95, Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
ASTM D97, Standard Test Method for Pour Point of Petroleum Products
ASTM D189, Standard Test Method for Conradson Carbon Residue of Petroleum Products
ASTM D482, Standard Test Method for Ash from Petroleum Products
ASTM D974, Standard Test Method for Acid and Base Number by Color-Indicator Titration
ASTM D4177, Standard Practice for Automatic Sampling of Petroleum and Petroleum Products
IP 143, Determination of asphaltenes (heptane insolubles) in crude petroleum and petroleum products
IP 375, Petroleum products — Total sediment in residual fuel oils — Part 1: Determination by hot filtration
IP 390, Petroleum products — Total sediment in residual fuel oils — Part 2: Determination using standard procedures for ageing
3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp

**additive**
material added to fuel oils usually in small amounts, to impart or enhance desirable properties or to suppress undesirable properties

4 Requirements

4.1 General requirements

4.1.1 The heavy fuel oils shall be hydrocarbon oils derived from petroleum or shale.

4.1.2 The heavy fuel oil shall be free from grit and other foreign impurities.

4.1.3 The fuel oils shall consist of liquid hydrocarbons oil derived from petroleum. Small amounts of additives of hydrocarbons or non-hydrocarbons may be added to improve other characteristics.

4.1.4 The heavy fuel oils shall be free from inorganic acids, excessive amounts of solid and fibrous foreign matter, and shall remain uniform in normal storage and not separated.

4.1.5 The heavy fuel oils shall be free from any contaminants such as lubricating oils or any other contaminant

4.1.6 Heavy fuel oil containing residual components shall remain uniform in normal storage and not separate by gravity into light and heavy oil components outside the viscosity limits

4.2 Specific requirements

The material shall comply with the requirements prescribed in Table 1, when tested accordance with the test methods prescribed therein.
Table 1 — Specific requirements for heavy fuel oils

<table>
<thead>
<tr>
<th>S/N</th>
<th>Property</th>
<th>Requirement</th>
<th>Test method</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>Viscosity at 50 ºC, cSt, max.</td>
<td>180</td>
<td>ASTM D445</td>
</tr>
<tr>
<td>ii</td>
<td>Density at 20 ºC, kg/l, max.</td>
<td>0.990</td>
<td>ASTM D1298</td>
</tr>
<tr>
<td>iii</td>
<td>Conradson carbon residue, % wt., max.</td>
<td>15</td>
<td>ASTM D189</td>
</tr>
<tr>
<td>iv</td>
<td>Sulphur content, % wt., max.</td>
<td>2</td>
<td>ASTM D4294</td>
</tr>
<tr>
<td>v</td>
<td>Vanadium content, mg/kg, max.</td>
<td>100</td>
<td>IP 501</td>
</tr>
<tr>
<td>vi</td>
<td>Asphaltenes, % wt., max.</td>
<td>10</td>
<td>IP 143</td>
</tr>
<tr>
<td>vii</td>
<td>Ash content, % wt., max.</td>
<td>0.12</td>
<td>ASTM D482</td>
</tr>
<tr>
<td>viii</td>
<td>Sodium content, mg/kg, max.</td>
<td>1/3 vanadium</td>
<td>IP 501</td>
</tr>
<tr>
<td>ix</td>
<td>Water content, % vol, max.</td>
<td>0.5</td>
<td>ASTM D95</td>
</tr>
<tr>
<td>x</td>
<td>Pour point, ºC, max.</td>
<td>15</td>
<td>ASTM D97</td>
</tr>
<tr>
<td>xi</td>
<td>Flash point, ºC, min.</td>
<td>66</td>
<td>ASTM D93</td>
</tr>
<tr>
<td>xii</td>
<td>Aluminium silicon+ silicon, mg/kg, max.</td>
<td>50</td>
<td>ASTM D5184</td>
</tr>
<tr>
<td>xiii</td>
<td>Net calorific value, MJ/kg, min.</td>
<td>40.5</td>
<td>ASTM D 4868</td>
</tr>
<tr>
<td>xiv</td>
<td>CCAI (calculated carbon aromatic index)</td>
<td>To be reported</td>
<td>ISO 8217</td>
</tr>
<tr>
<td>xv</td>
<td>Nitrogen content, % wt., max.</td>
<td>0.4</td>
<td>ASTM D3228</td>
</tr>
<tr>
<td>xvi</td>
<td>Sediment by extraction, % wt., max.</td>
<td>0.15</td>
<td>ASTM D473</td>
</tr>
<tr>
<td>xvii</td>
<td>Existent sludge, % m/m, max.</td>
<td>0.1</td>
<td>IP 375 Part 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IP 390 Part 2</td>
</tr>
<tr>
<td>xvii</td>
<td>Potential sludge, % m/m, max.</td>
<td>0.1</td>
<td>IP 375 Part 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IP 390 Part 2</td>
</tr>
<tr>
<td>xix</td>
<td>Neutralization strong acid number, mg KOH/g</td>
<td>Nil</td>
<td>ASTM D974</td>
</tr>
<tr>
<td>xx</td>
<td>Calcium, mg/kg, max.</td>
<td>30</td>
<td>IP 470, IP 501</td>
</tr>
<tr>
<td>xxi</td>
<td>Phosphorus, mg/kg, max.</td>
<td>15</td>
<td>IP 500, IP 501</td>
</tr>
<tr>
<td>xxii</td>
<td>Zinc, mg/kg, max.</td>
<td>15</td>
<td>IP 470, IP 501</td>
</tr>
</tbody>
</table>

5 Packaging

The condition of the containers, rail tankers and road tank vehicles shall be such as not to be detrimental to the quality of the fuel during normal transportation and storage. The containers shall be acceptably sealed or leak-proof, clean and free from materials soluble in fuel oil as applicable.

6 Labelling

6.1 The following information shall be clearly marked on the container, or on a label affixed to the container:

a) manufacturer’s/ supplier’s name and address;

b) name of product as “Heavy fuel oil”;

c) net content;
d) batch/lot number;
ed) word “FLAMMABLE MATERIAL”; and
f) warning “DANGER FUEL OIL”.
g) country of origin
h) viscosity

6.2 For bulk transportation the above information shall be in the documentation accompanying the product.

7 Sampling
Sampling of heavy fuel oils shall be carried out in accordance with ASTM D4057 or ASTM D4177.
Bibliography

